Draft of the project for the environmental integration of the Ca n'Alemany spillway dam and the stream of Sant Llorenç, in Viladecans (Barcelona)

Client   Viladecans City Council
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The present project has a double objective. On the one hand, it is about the environmental integration of the spillway dam that is to be built in the polygon of Ca n'Alemany so that it, besides fulfilling its laminating function, also has an ecological, landscape and social function . On the other hand, this project also aims at the overall suitability of the Riera de Sant Llorenç, near the raft previously named and which is currently in very poor condition, with the aim of improving its ecological and landscape status. All the planned actions have been determined considering all the hydraulic and structural constraints defined in the initial project as well as minimizing their maintenance needs.

As far as the dam is concerned, the actions taken in it are based on the desire to guarantee permanent water throughout the year, to maintain the laminating capacity of the dam, to vegetate the area properly and to create pleasant environments for the establishment of the fauna and social use of the area. In this sense, it has been proposed to modify the topography of the dam so as to reach the phreatic level and thus ensure the existence of an area with permanent water throughout the year.In this area is also proposes the construction of an island to create a refuge for wildlife. Likewise, it is also slightly modified the topography of the bottom of the dam to create preferential paths for the circulation of the water and, thus, to direct it towards the zone of permanent waters and, later, towards the drainage of the dam direction to the Riera of Sant Llorenç.

Another important action is the construction of two green filters at the main water inflows to the dam in order to lightly purify the incoming water and the water going to the zone of permanent water are of higher quality, with the environmental advantages this entails. The initial points of these green filters will be waterproofed to avoid the filtration of that water with more pollutant load. In the entrance of water to the dam is also proposed the installation of stones as energy dissipators and slope protectors.

Another proposed action in the dam is the protection of the base of the slope by the installation of fiber rolls structured in coir fiber to avoid landslides until the vegetation is sufficiently developed to stabilize the slope by itself.

Finally it is proposed the implantation of vegetation in the area with native wetlands plants. Phragmites australis, Thypha sp., Iris pseudacorus, Lythrum salicaria, Cladium mariscus, Spartina juncea, Lythrum salicaria, Cladium mariscus, Carex pendula and Carex vulpina are the main spices that are planted. Regarding shrubs, Viburnim tinus, Crataegus monogyna, Cornus sanguinea, Salix elaeagnus, Salix purpurea, Vitex agnus-castus and Tamarix galica are selected.

Finally, Populus alba and Fraxinus angustifolia are proposed as trees of the environment. The plantation techniques proposed are diverse, from pre-vegetated plant pallet, through the plant structured in fiber and the manual seeding. All plantations are made taking into account the characteristics of each environment to choose the best species. Thus, in less humid areas the planting of reeds is proposed and in the more shaded areas Carex pendula is planted. Finally a plantation of a mixture of seeds will be made by applying a hydroseeding. Finally there is the installation of measures to promote the establishment of the fauna as nest boxes or bird-resting trunks.
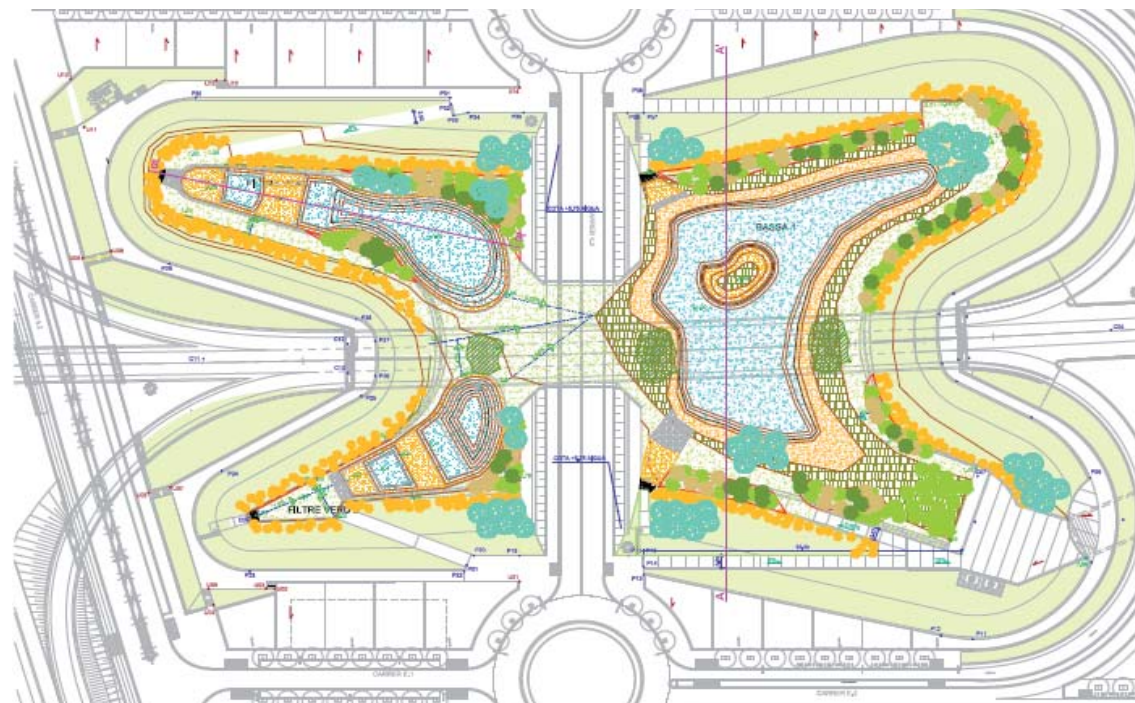

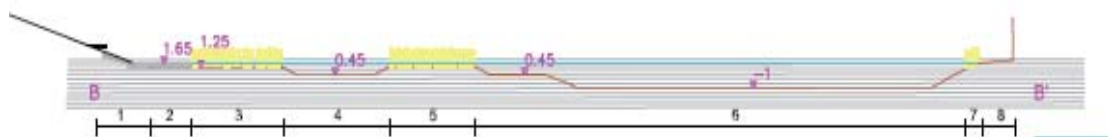Image 1 // 1. Plan of the spillway dam.

Image 2 // 2. Profile of the green filters to access the spillway dam.

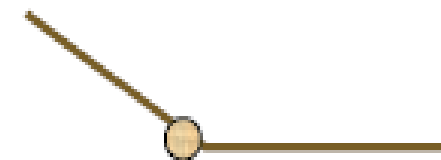Image 3 // Profile water inlets towards green filters

Image 4 // Protection of slopes with coir fiber rolls.

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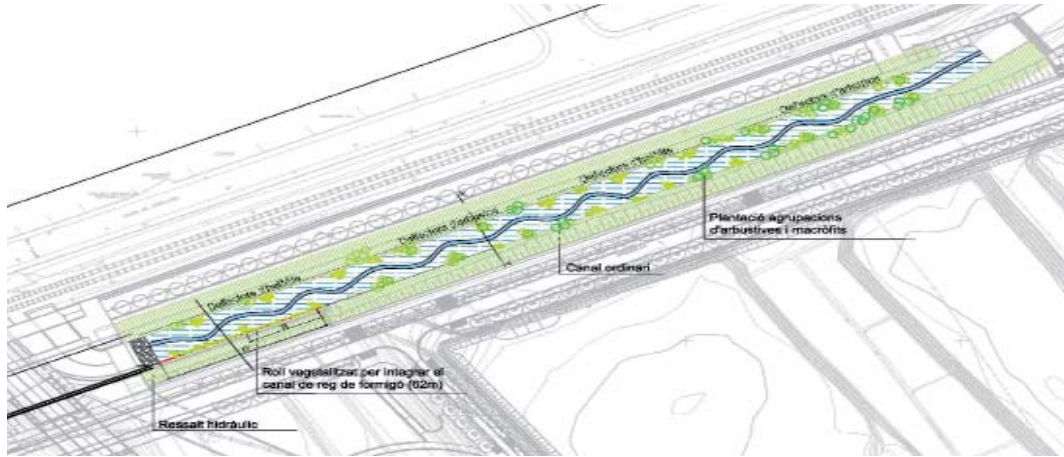# ENVIRONMENTAL INTEGRATION OF THE CA N'ALEMANY SPILLWAY DAM AND THE STREAM OF SANT LLORENÇ IN VILADECANS (BCN)

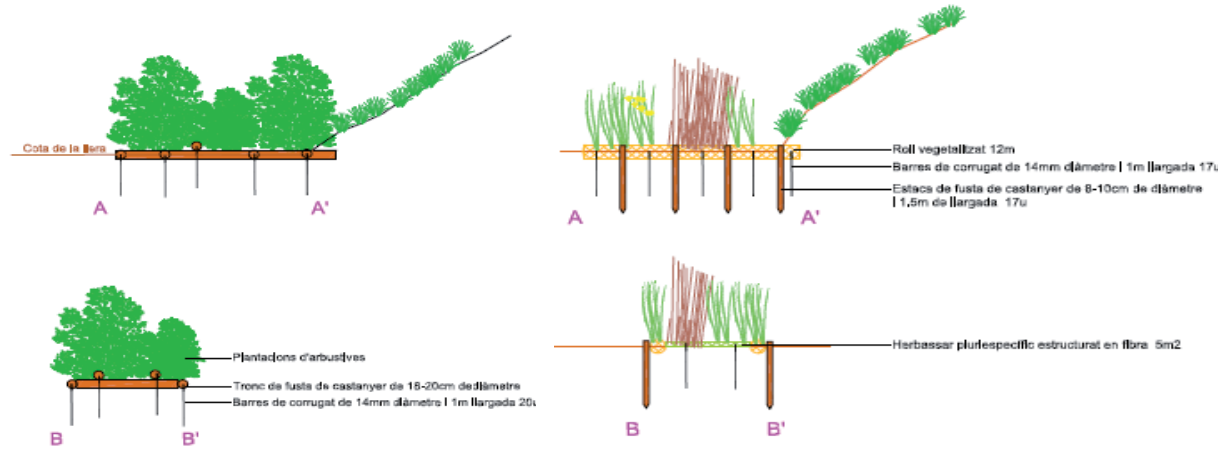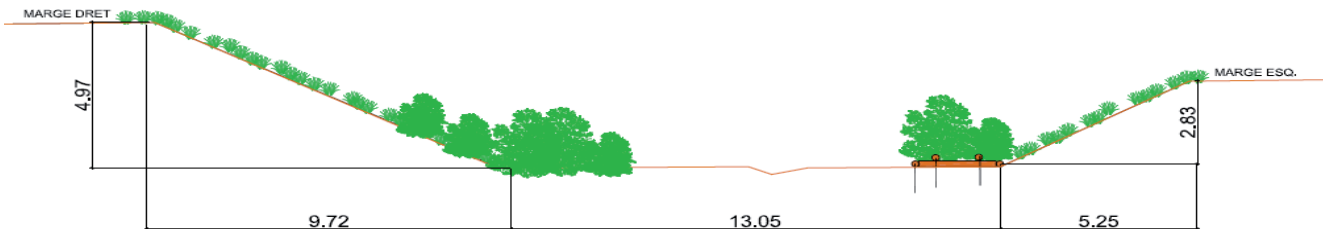Image 5 // Plan of the stream of Sant Llorenç.

Regarding the actions planned for the environmental and landscape improvement of the stream of Sant Llorenç, the aims are to remove invasive plants, mainly *Arundo donax* and *Ricinus comunis*, and clear the whole of the area. Additionally, actions are also devised to increase the speed of the water flowing through the stream and thus improve its ecological and environmental quality. To make this possible, the aim is to install vegetated deflectors that help drive the water to the centre of the stream. The vegetation growing in the deflectors will be species which thrive in wet climates, such as *Vitex agnus-castus, Salix purpurea, Salix elaeagnos, Tamarix gallica, Lythrum salicaria, Scirpus holoschoenus, Iris pseudacorus* and *Cladium mariscus*.

Since the stream is integrated with the urban centre of Viladecans, dumping floating waste and other substances in the stream frequently occurs. This causes the stream to carry a variety of waste which needs to be withheld and removed from its course as much as possible. To achieve this, the plan is to build a hydraulic jump to dissipate the power and divert the solid elements flowing in the water.

On the stream banks, vegetation adapted to the environment conditions and with low maintenance needs will be planted. These plants include shrubs such as Vitex agnus-castus, Salix purpurea, Tamarix gallica and Salix eleagnos. Reeds will also be planted and a hydro-blanket projection will be made using wet meadow species.

Finally, the plan also envisages the landscape and environmental integration of the irrigation canal adjacent to the right bank of the stream. To carry out this action, the aim is to install a vegetated roll next to the canal.

Image 6 // Profile of the deflectors to be installed in the stream of de Sant Llorenç.

Image 7 // Type of profile of the stream of Sant Llorenç.
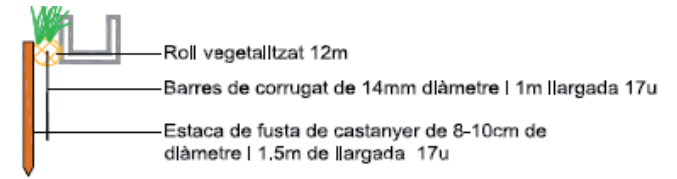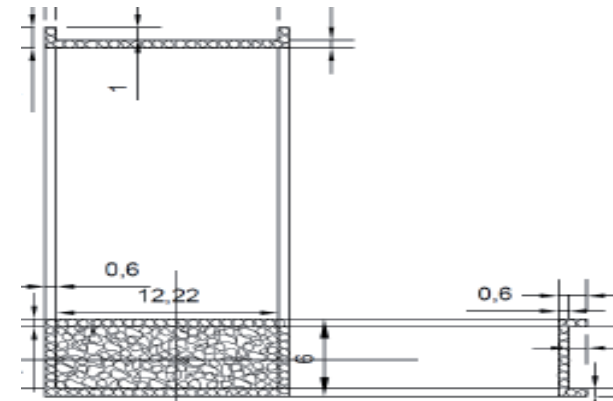

Image 8 // Scheme of irrigation canal integration.

Image 9 // Diagram of the hydraulic jump.

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